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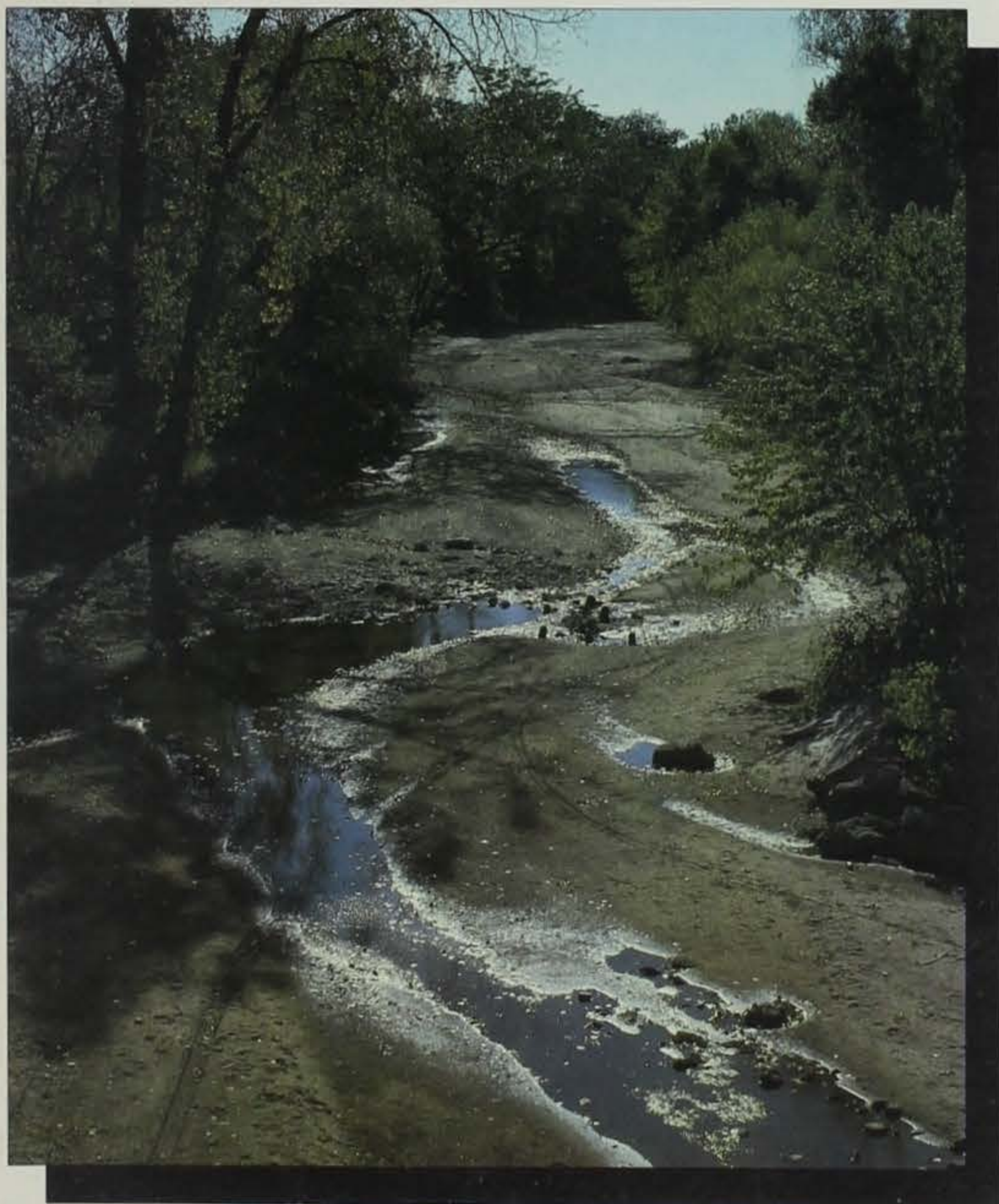


by Joe Wilkinson



WATER CONSERVATION

around the home



Tom Putnam

Drought is not likely a great concern to most Iowans this year, but water conservation should be. The above photo of the Skunk River is a reminder of recent water shortages.

It resembles the scenario of a futuristic movie; trucks back into a loading bay, take on their cargo, and rumble off to deliver it. Inspectors comb the neighborhood, checking for underground leaks; sonar gear detecting barely audible signals. Police go house to house, checking for compliance, on the lookout for violators. State battles state; towns vie for the best access, in a shoot-out for the rights to this valuable resource. It is not gold. It is not oil. It is not some twenty-first century science-fiction discovery. It is water -- clean water. While no one yet pictures a battlefield mentality in the fight for water, each of the scenes mentioned above has taken place in the past couple years . . . some of them in Iowa.

It was as recent as 1989 when National Guard trucks brought badly needed water to dusty communities in southern Iowa reeling from back-to-back droughts and dry wells. In overcrowded areas of California, specially rigged trucks pick up the sound of underground water leakage, so crews can be dispatched to plug the leaks to conserve municipal supplies. We may not yet have "water police," but mandatory water metering has

been established in many regions. Many others are being urged to do the same.

In the 1990s, the battleground for water is the courtroom. Everybody wants their fair share of a dwindling water supply. It seems nobody can decide what constitutes a "fair share." One thing is certain -- population trends, economic expan-

sion and changing weather patterns (short and long term) in Iowa and across the country indicate the volley that has sounded thus far is just the opening round in the fight for water.

Water — fresh water — is a finite resource. The fight over who gets it could create a major environmental logjam as we enter the next century. Burgeoning populations in the northeast, in already overcrowded centers in California and in the arid southwest have already begun the precarious ticking of this "water time bomb" dilemma. Back-to-back years of drought in Iowa, with dry wells, emergency water guidelines, parched fields and brown lawns remind us it can happen here, too. Though not at a critical stage in Iowa, water conservation at home, on the farm and in industry can stave off hard-to-swallow mandates in the years ahead.

poor quality or hard-to-reach groundwater supplies. Their shallow well and surface water capacity does not meet demand in dry weather." Delivery of that water can be expensive. It costs money to locate adequate water, to dig the wells, to treat the water and to pump it to the customers. Multiply that by tens of thousands of customers and you can realize the dilemma facing water utilities in large cities, faced with increasing demand and shrinking availability of easily accessible water.

There are solutions. However, their acceptance is mixed at best. Some are expensive. Some are unpopular. Many require "getting used to" and are inconvenient in a society driven by convenience. Any combination of them, though, can be applied in the home to help drive down water consumption. That saves money and extends the life of a valuable resource. And a change in water use attitude is cheaper than any of the appliances, gadgets, regulations or laws available . . . or on Iowa's horizon.

On an individual basis, water use generally goes unnoticed. Priced in units of hundreds of gallons, thousands of gallons, or perhaps priced at a flat rate without regard to volume used, water is cheap. It is easy to overlook the monthly water bill as one scrambles to pay the mortgage, make another car payment, cover the grocery checkout total and cut into that overdue credit card account. However, increasingly more people are noticing the bottom line on the utility bill. Some of us are even trying to cut down. "Very rarely would someone ask about water saving fixtures a few years ago," recalls Iowa

City plumbing contractor John Balmer. "Now it is fairly common; maybe one in three customers asks about them." Balmer feels it is a combination of environmental awareness and the availability of water-saving products on the market. "Manufacturers now have to produce low-volume toilets, shower heads and faucets for states like California and Massachusetts, so they have become available for us," says Balmer. "Once they are available, we start selling them. We have more

Water meters can be used to detect leaks in your water system.

- ◆ **Locate your meter.**
- ◆ **Turn off all faucets in and around the home.**
- ◆ **Check the meter reading.**
- ◆ **Wait 15 minutes.**
- ◆ **Read your meter again. If the reading has changed, you have a leak that needs immediate attention.**

Conserving water conserves energy, too. It also helps avoid the search for more adequate water sources. "A sobering fact is that high quality water is not abundant throughout the state," points out water resource supervisor Donovan Gordon, from the DNR geological survey bureau. "Increasingly, rural areas and smaller communities are looking to rural water systems to meet their needs for potable water. Much of southern and western Iowa, for example, lie above

styles in 1991 -- four or five different models." He says the push for low-flow fixtures will increase. "By the end of the year, it could be 35-50 percent. Remodeling projects are likely candidates for water conservation efforts." Cost is still a factor, however. Balmer says a one-and-a-half-gallon-flush toilet costs about \$130, compared to \$85 for the conventional model with a three-and-a-half-gallon flush. The savings come, though, over the life of the fixture -- not in the first couple months of slightly reduced water bills.

When the topic is water conservation, the focus is on the bathroom. A U.S. Department of Housing and Urban Development (H.U.D.) report says 75 percent of the water we use in the home goes down the bathroom drains. Laundry, dishes and other cleaning chores claim 20 percent. Only five percent of our in-home water use goes toward cooking and drinking. Consequently, any serious water conservation is going to be achieved in the bathroom. Most conventional toilets in Iowa use three and a half gallons of water per flush. Many older models, often found in homes built 30 years ago or more, flush away five to seven gallons each time. Compare that to new, low-volume flush models and the savings is immediate. At 20 flushes a day -- considered average for a family of four -- replacing a three-and-a-half-gallon toilet with the one-and-a-half-gallon, low-volume designs will save an estimated 57 percent of the water used for flushing. Over a year, the average household could avoid using anywhere from 9,400 to 25,700 gallons of water. If that low-volume model replaced an older, five- to seven-gallon toilet, the savings would be in the 70 to 80 percent range. Since toilets use nearly 40 percent of all water inside the home, the effect on your water bill would be dramatic.

About 30 percent of the water we use in our homes is for bathing and showering. In the full-open position, a conventional showerhead sprays five to eight gallons of water each minute. A low-flow showerhead, which still supplies a significant discharge, cuts that to less than three gallons. Another H.U.D. study shows the savings can be 7.2 gallons per person, each day, with the low-flow device. In a month's time, that would be nearly 900 gallons for a family of four. Over a year, that is more than 10,000 fewer gallons used, or paid for, when the bills arrive. And in addition

to these savings are the savings from not having to heat that water.

Much of the water going down the drain is not even used. Leaking toilets, dripping faucets and other plumbing flaws can cause heavy losses. A Washington, D.C. company, which specializes in plugging water leaks in apartment complexes, says it is not unusual for a building to lose up to 25 percent of its daily water consumption through an improper ball and float sealing in toilets. Retrofitting fixtures with washerless plumbing or at least replacing faulty gaskets and seals can turn off that stream of unused, but paid for, water.

Laundry and other cleaning chores add another 20 percent to the water used in the "average" home. Many washing machines, dishwashers and other appliances feature sudsavers and energy saving cycles. Proper use saves about three gallons of water per day, for each person in the home.

Though generally restricted to the summer months, outdoor water use in Iowa can be heavy. Lawn watering, gardening and car washing all keep the water meter clicking. As much as 50 percent of the water we use during the warm, dry summer months is splashed outside the house. That figure goes up or down, of course, depending on rainfall, size of yard, watering habits and other factors. A few adjustments in how you manage your watering chores can take a sizeable chunk out of the monthly total. Evening or early morning watering is the best use of water. More of it soaks into the soil, rather than evaporating in the hot sun. Mulching around young trees and shrubs retains moisture that would otherwise bake out of the top layer of soil. Many grass species are resilient and tolerate an extended dry period with little or no damage, once normal weather returns. In other words, they turn a little brown, but return to green when it rains. An innovative water conservationist might try to landscape with drought resistant plantings and experiment with capturing rainwater for later use.

How much can you save? Obviously, that depends on the rate structure of your community. When the drought years of the late 1980s hit, many communities were selling water to residents on a decreasing-block-price plan; the more you used, the less you paid (per unit used). Many

others sold water at a single price, per unit, no matter how much was used. There was no real incentive for the residential user to cut back on water use. Now those communities are being urged by conservationists to consider increasing-block-price structuring. A target of sorts would be set. Up to that limit, a person would pay one price per unit of water. Beyond that, the price per unit would increase. Municipal water suppliers, which were established on a system which encourages higher consumption, could face troubles if water conservation caused their revenue to dip. That is why communities are proceeding cautiously before shaking up their income stream. Water and wastewater treatment plants are expensive, and the rate structure designed to pay for them needs to be adjusted carefully to avoid the potential deficits of a water conservation program.

Examples of individual water savings can be impressive. In the Washington, D.C. area, an apartment building owner recouped, within months, a \$15,000 investment in leak repair and retrofitting. The savings was estimated at \$10,000 to \$25,000 above his investment at the end of a year. An early (1973) water conservation program in Boston at a major insurance company is saving two million gallons of water a year and 500,000 pounds of steam. Obviously, savings in Iowa are not often going to approach this scale, but it points to the potential offered by a serious water conservation program. In Iowa, water is cheap compared to other expenses. With a vivid memory of drought, rising energy costs and other economic and political unknowns lying ahead the price of fresh water could easily move out of the "bargain basement" in the future.

During 1988, 12 Iowa communities were monitored for the energy costs associated with providing water and treating wastewater. On average, it took about 16 cents to treat 1,000 gallons of water. The range went from seven cents to 31 cents, depending on equipment, efficiency and the source of the water being tapped. To treat the returned waste water, the survey showed an average energy cost of 12 cents per 1,000 gallons. Still, energy costs are just one component in the pricing structure in a community. As old pumps are replaced, as aging delivery lines wear out and as higher demand mandates expensive new facilities, pennies turn into big bucks. That is when water conservation

begins making a lot of sense.

Rural residents can follow any of the water saving recommendations considered by urban dwellers. Since most rural homes are supplied by individual wells, or other non-metered supplies, they might not see the direct financial impact, such as higher utility bills. For them, the price tag is a little farther down the road -- a deeper well, a new pump, the need for a rural water system. These bills come due all at once. Conserving water now could delay those expensive alternatives for years.

What is the forecast for Iowa? "The demand for water will probably increase as it has in the past," says Gordon. "These increased demands will probably not be uniform across the state but concentrated in areas where economic growth and business expansions are occurring." Gordon says that may not match up with areas of abundant water to meet the demand. He urges long-term, water-conservation planning as an essential tool in Iowa's future water management. Water-supply planning also rates as a priority. He sees projections of water demand and construction demands as essential to an informed decision by the public. If people realize new water plants, higher demand and higher costs to produce that water lie ahead, they might choose to conserve water now, to delay that expensive proposition. "It is questionable," says Gordon, "whether the state can continue to serve every water need with the best quality water available, as is the current practice."

The hot, dusty summers of 1988 and 1989 caught many unprepared. Communities rushed into emergency "conservation" programs. Almost as quickly, the word conservation was dropped as 1990 brought cooler weather and more rain. Severe flooding then became the disaster-of-the-year in Iowa. Slowly growing demand for water worldwide and hints from nature that "warmer" and "drier" might be frequently used terms to describe future weather patterns, should sound an alert. With all the policies, gadgets, rates and innovations, the biggest change we need is also the cheapest -- our attitude toward water.

Joe Wilkinson is an information specialist for the information and education bureau in Iowa City.

Water Saving Tips

Inside -- The bathroom accounts for nearly 75% of all water used in the home. Small changes can equal big savings.

- ◆ Install low-volume toilets or reduce the volume per flush by installing a water displacement device in the toilet tank. Never use a brick.
- ◆ Install low-flow showerheads.
- ◆ Shorten showers, or better yet, take baths. Only the shortest shower uses less water than a partially filled tub.
- ◆ Replace leaky seals in plumbing. A small drip from a worn washer can waste 20 or more gallons a day. Check the toilets for leaks as well. Drop food coloring in the toilet tank. If color appears in the bowl, there is a leak that requires immediate attention.
- ◆ Turn the water off when not using it. Don't let it run while brushing teeth or shaving. Use a cup to rinse after brushing and rinse your razor in a sink of water.
- ◆ Run the dishwasher and laundry only with full loads. Use water-saving cycles when they are available.
- ◆ Clean vegetables in a pan of water, not under a running faucet. The water collected can be used for household plants.
- ◆ Keep a bottle of drinking water in the refrigerator -- there is no need to run the tap to get a glass of cool water.

Outside -- The amount of water used outdoors can vary greatly. Water consumption can be as much as 500 to 1,000 gallons per day during the summer months.

- ◆ Water only when needed.

- ◆ Water only as rapidly as the soil can absorb the water.

- ◆ Turn off unattended hoses.

- ◆ Install a trickle or drip irrigation system for a slow, steady supply of water to the roots. This method can save up to 60% over other watering techniques.

- ◆ Consider water requirements when purchasing new plants. Landscape with drought-resistant plantings. Generally native plants require less care and water than ornamental varieties.

- ◆ Divert rainwater for later outdoor use.

- ◆ Water the lawn in the morning or evening when evaporation is less likely to occur. Don't water during the heat of the day or when it is windy.

- ◆ Mulch around plants to prevent excess moisture loss.

- ◆ Use a broom, not a hose, when cleaning driveways.

- ◆ Use a hose with a shut-off nozzle to wash the car.

- ◆ Locate the master water supply valve and label it. The master supply valve can be easily turned off in case of a major leak or broken pipe.

Community

- ◆ Inspect water delivery systems for leakage.
- ◆ Establish and publicize water contingency plans *before* emergencies occur.
- ◆ Establish water audits for customers.
- ◆ Consider an increasing-block-price rate structure.

What's the Catch

To Tournament Fishing

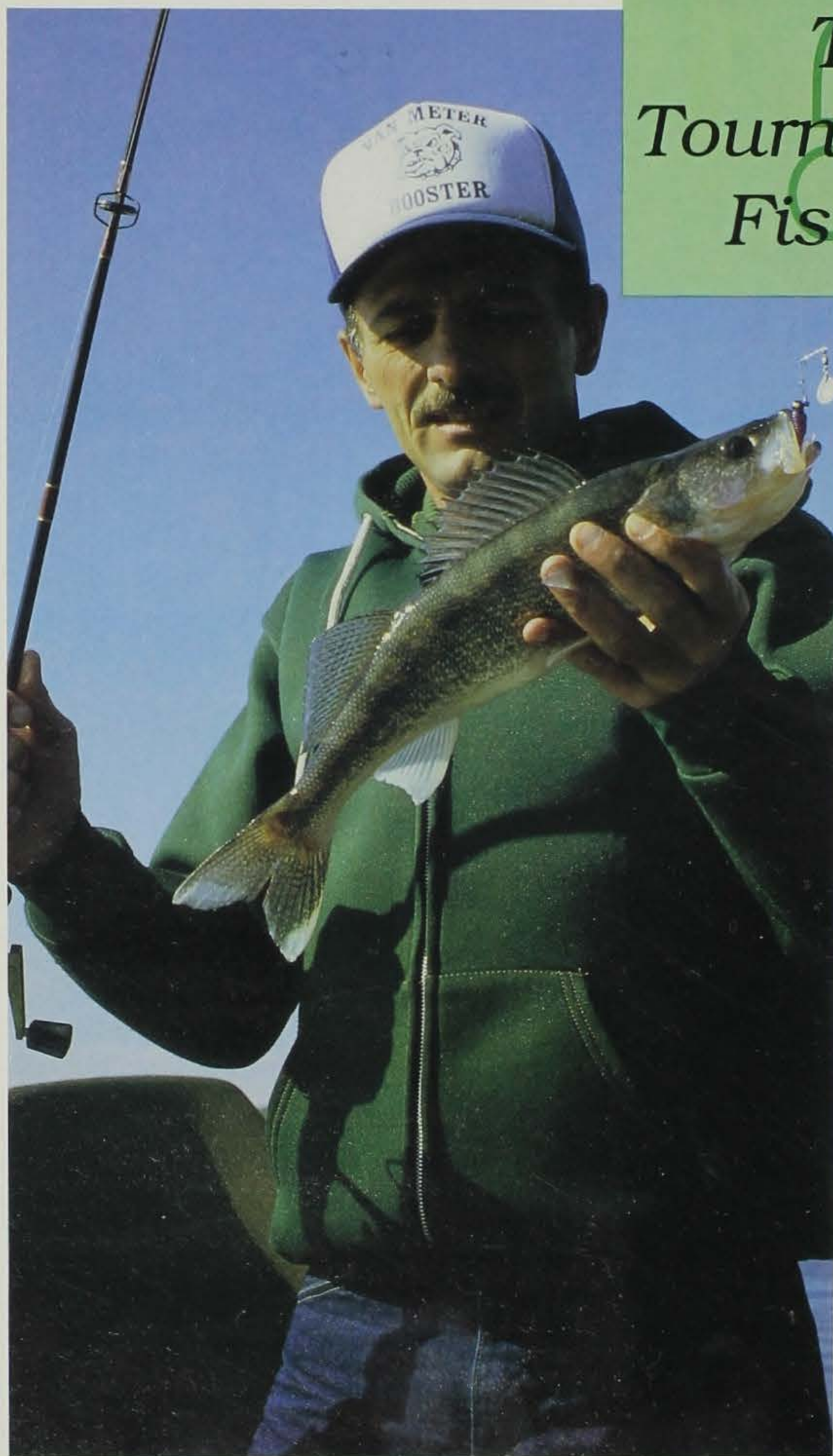
by Stephen J. Waters

Fishing tournaments have been popular in Iowa, as in most states, for a number of years. However, limited information was available to assist the DNR in managing these events.

The lack of baseline fishing tournament information such as number, type, location and duration of events, plus an account of those participating and what they are catching is necessary in order to manage this special activity. Also, both competitive and non-competitive anglers wanted a reduction in congestion at boat ramps and on the water when tournaments were being held. In order to do this -- to monitor, regulate and protect the fisheries resource -- a permit program would be necessary. Iowa's fishing tournament permit and report program was first initiated in 1989.

Iowa Code establishes permit application procedures for the public to follow and criteria to be met when conducting fishing tournaments. The Iowa Department of Natural Resources fisheries bureau regulates these procedures.

A fishing tournament held on Iowa public waters under jurisdiction of the state is defined



Ron Johnson

as any organized fishing event with six or more boats, 12 or more participants, or where an entry fee is charged or prizes or other inducements are awarded. Fishing clinics and youth fishing days are excluded from the permit system.

Groups, organizations and individuals wishing to sponsor a fishing tournament must contact the DNR's fisheries bureau for an application. Applications should be received by the department at least 30 days prior to the event, but will not be accepted prior to July 1 of the year preceding the calendar year in which the tournament is scheduled.

After a completed application is received by the fisheries biologist, it is returned to the tournament sponsor, with any "special condition" adjustments. Within 30 days after completion of a tournament a report using DNR forms, must be completed and returned to the fisheries biologist.

The fisheries biologist "special conditions" segment of the permit allows for adjustment of the permit to conform with department guidelines or unique situations at a particular water body. For example, all tournaments involving bass, walleye, muskellunge or northern pike require the release of live fish and the use of an aerated live well if a weigh-in is involved. Designated release areas and multiple weigh-ins may also be required by the permitting biologist.

All tournament sponsors involved with live release contests receive a publication which will assist them in running a tournament that can keep fish mortality at a low level. The "special condition" requirements will also help keep the mortality of select tournament-caught fish at an acceptable level. This will be a benefit to

both competitive and non-competitive anglers. Keep in mind, non-competitive anglers also have responsibility to return healthy top-predator fish back to the water; these actions will enhance quality fishing conditions for all anglers.

There were 357 fishing tournaments permitted in Iowa during 1989, the first year of the tournament program. Seventy-five percent of the contests were black bass tournaments, 12 percent were for multiple species, five percent for walleye/sauger and three percent for

catfish; there were only a few contests for crappie, carp, muskie and bluegill.

Southern Iowa and the Mississippi River dominate the tournament scene because popular fishing areas are located there (see Figure 1). The majority of walleye/sauger tournaments are held on the Mississippi River and the remaining contests are scattered throughout the state.

The number of anglers that fished in permitted tournaments was 30,624 in 1989. Tagged fish contests (primarily two

Summary

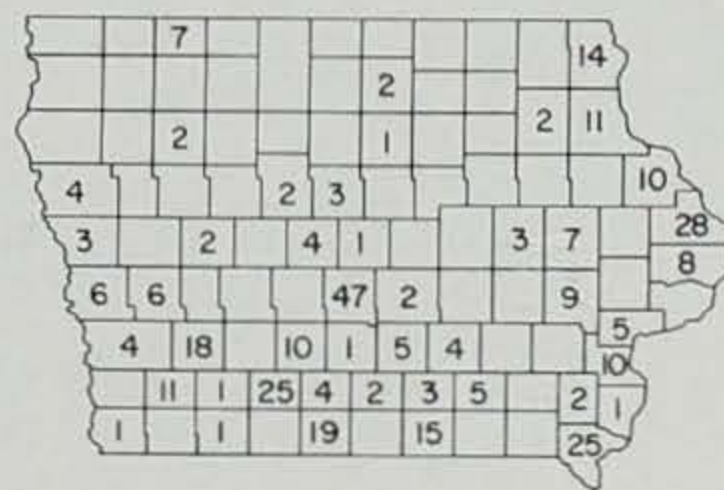
During its first year, Iowa's fishing tournament permit and report program was a success. It greatly reduced user conflicts at boat ramps and water bodies; it showed the department where the contests were held, what kind they were, and how many anglers they attracted; and provided biological information to best protect a valuable resource. This program has the flexibility to change in order to best meet the needs of the competitive and non-competitive angler and the resource that attracts both interests.

Contacts for Fishing Tournament Applications and Information:

1. Fisheries Biologist, Northwest Regional Office, Spirit Lake Fish Hatchery, Spirit Lake, Iowa 51360
2. Fisheries Biologist, Southwest Regional Office, Cold Springs State Park, Lewis, Iowa 51544
3. Fisheries Biologist, Northeast Regional Office, Manchester Fish Hatchery, Manchester, Iowa 52057
4. Fisheries Biologist, Southeast Regional Office, Lake Darling Station, R.R. 1, Brighton, Iowa 52540

Ten most popular tournament locations.

Area	No. of Contests
Mississippi, Pool 12	34
Mississippi, Pool 19	34
Saylorville Reservoir	29
Mississippi, Pool 9	26
Lake Anita	17
Little River Lake	17
Big Creek Lake	15
Twelve-Mile Lake	13
Rathbun Reservoir	12
Green Valley Lake	11



▲ All Tournaments

Figure 1. Iowa Permitted Fishing Tournaments Grouped by County, 1989.

"crappiethon" tournaments), bass and multiple species contests accounted for 90 percent of all anglers fishing in tournaments. All tournaments combined resulted in a total of more than 181,000 hours of fishing.

Tournament anglers caught 35,229 fish, of which 39 percent or 13,989 were bass. Crappie catches totaled 8,000 (primarily from two "crappiethon" tournaments), and about the same number of fish were caught in multiple species contests.

Iowa's tournament permit and report program shows the importance of bass tournaments to the state. These contests ranked first in number of tournaments, hours fished, and fish caught, and ranked second for the number of anglers fishing the events.

The data collected also shows differences in catch rates from one water body to another and the type of tournament held. For example, the catch rates for bass for all Mississippi River pools was .31 (a catch rate of one equals one fish caught for one hour of fishing), but was only .07 for inland lakes combined. If tournament sponsors opted for immediate catch-and-release tournaments, their catch rates jumped to .38 for inland lakes and .48 for the Mississippi River. This means a bass tournament using immediate catch-and-release principles will have a higher catch rate than one which requires a weigh-in. A catch-and-release tournament also produces higher survival rates than weigh-in contests which also employ a number of special con-

dition requirements to achieve acceptable survival rates. This illustrates some of the uses of the tournament report data.

Conflicts were avoided or reduced at boat ramps and on water bodies by adjusting permits to keep control over the number and size of tournaments at a site. If more than one tournament was scheduled for a smaller lake, then the first application received was awarded the use of that area. Conflicting tournament sponsors were given alternative open dates for their tournament at the originally requested site and alternative sites. This eliminated conflicts between tournament sponsors and significantly reduced potential use conflicts between competitive and non-competitive anglers using a ramp or water body.

CONTEST FISHING

Are We Selling Our Fish to the Highest Bidder? by Tom Boland



Tom Boland

What has been the most highly prized fish caught in Iowa -- that is, the fish worth the most dollars? To date only a few anglers have been able to convert fish flesh to big dollars. However, the big ones that have succeeded have done so in a big way. The success stories would include the 1989 and 1990 "crappiethon" contests held on the Mississippi River (Pool 14) and Lake Rathbun, where a total of more than \$113,500 was paid to contestants. One happy woman received \$45,000 for catching the right crappie -- Tangle Free Tom -- during the 1989 Lake Rathbun contest. Also, the 1989 and 1990 Masters Walleye Circuit Championships have been held near Dubuque, where the winning team takes home \$10,000 cash and prizes valued at another \$10,000. Other fishing contests have offered big dollar prizes for catching the "right fish," but did

Adjustments have been made to the permit program as a result of data collected from the initial year. For example, no walleye/sauger tournaments requiring a weigh-in are permitted during the months of June, July and August because of high mortalities caused by warm-water handling stress. Other protective special condition adjustments have also been made in an effort to keep top predator populations at their best.

Stephen J. Waters is the southeast regional fisheries supervisor for the department at Brighton.



Missouri DOC

Seventy-five percent of the fishing contests held in Iowa in 1989 were black bass tournaments. Iowa's tournament permit and report program shows the importance of bass tournaments to the state.

not have to pay off. They included a tagged walleye worth \$98,000 near Clinton, and a tagged carp worth \$10,000 (or a carp-colored Ford Bronco) from the Okoboji Lakes area.

The Controversy

It should be no surprise to anyone that the popularity of contest fishing and tournament fishing is on the increase not only in Iowa, but in most states where fish and anglers coexist. Fishing contest promoters and contestants commonly ask, "What is wrong with offering dollars, in some cases big dollars, for catching the right fish or the most pounds of fish?" It is simply promoting the use of a renewable natural resource. Also, large contests will bring many dollars into a city or area's economy. However, many non-contest anglers insist that contest fishing, particularly tournament fishing, should be "outlawed." They

claim tournament anglers are not fishing for the "right reasons." They argue that money and fame are not the reasons anglers should be fishing and that the money brought into an area goes to motels, gas stations and bait dealers and not to the fishery resource. They also complain that contest fishing does nothing more than overcrowd an area which may lead to over harvest of a fishery.

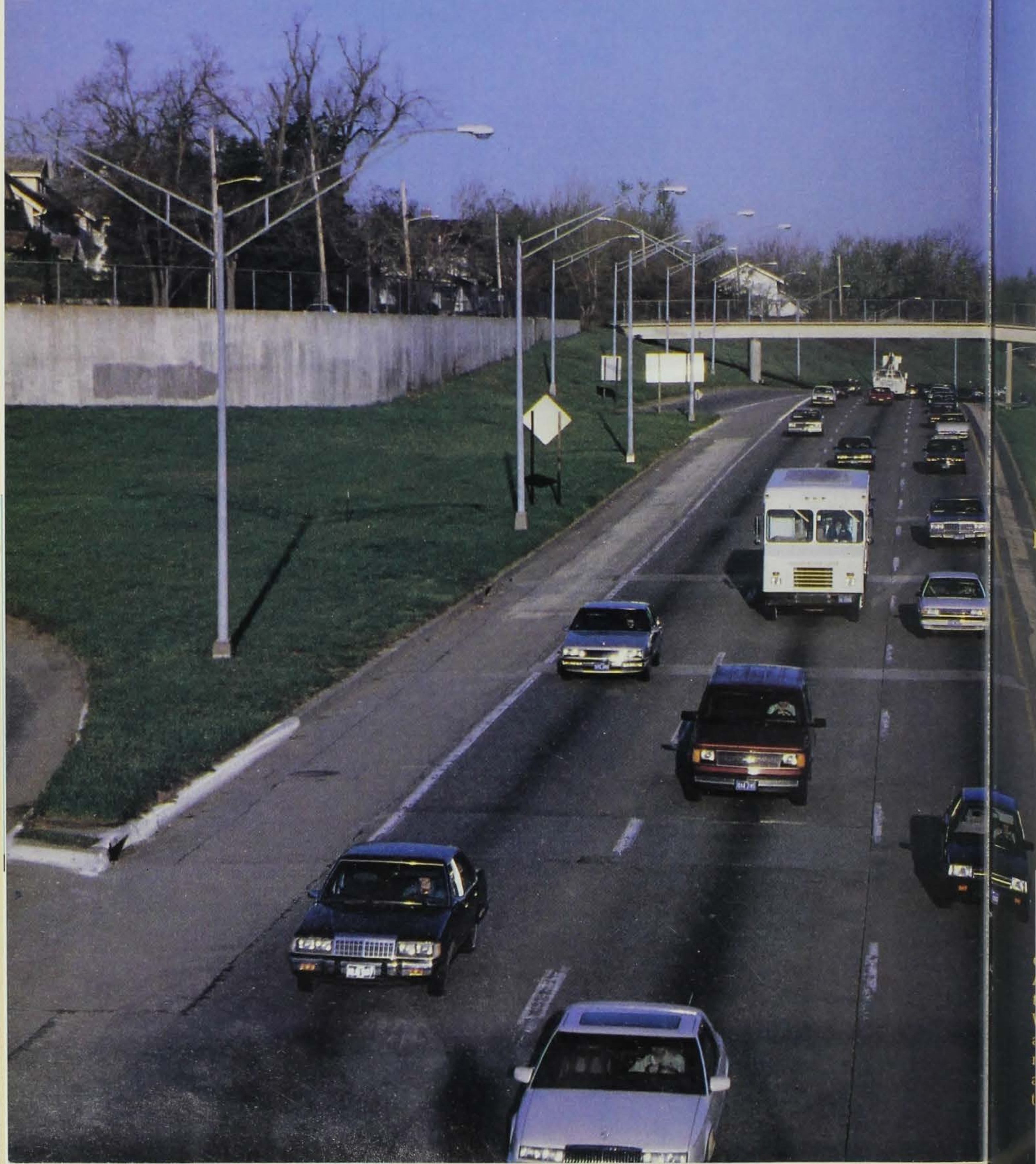
Who is right?

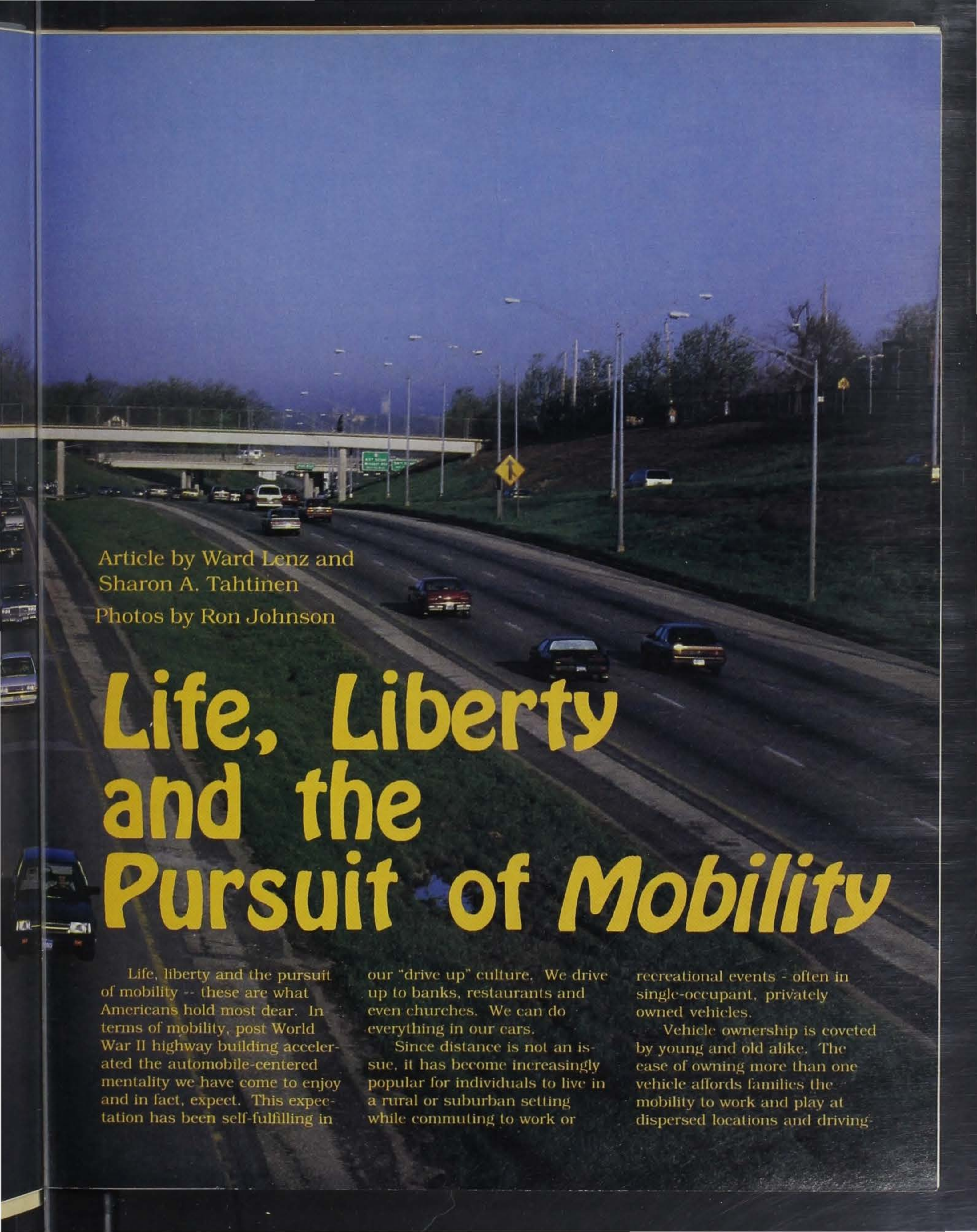
The DNR's Role

You guessed it! We are not going to try to answer the "who is right?" question in the limited space of this article. For the most part, the answer is still being worked out. However, it is important to briefly discuss the DNR's role and current policy concerning contest fishing. The DNR's major role concerning contest fishing is a simple one — when anglers, be they contest or otherwise, go

fishing, there should be quality fish to catch. This means that the DNR must recognize both contest anglers and non-contest anglers for what they are — simply anglers, each group having no less or no more "rights" than the other. They may be fishing for different reasons, but for the most part, the end result to the fishery is very similar. The current policy for contest fishing requires that a permit must be obtained from the Iowa DNR. This permit program not only monitors and regulates fishing contest procedures, but will also help protect and maintain a viable fishery. In time, the information collected with the permit program will become invaluable to Iowa fish managers when faced with making future fish resource management decisions.

Tom Boland is a fisheries biologist for the department at Bellevue.





Article by Ward Lenz and
Sharon A. Tahtinen

Photos by Ron Johnson

Life, Liberty and the Pursuit of Mobility

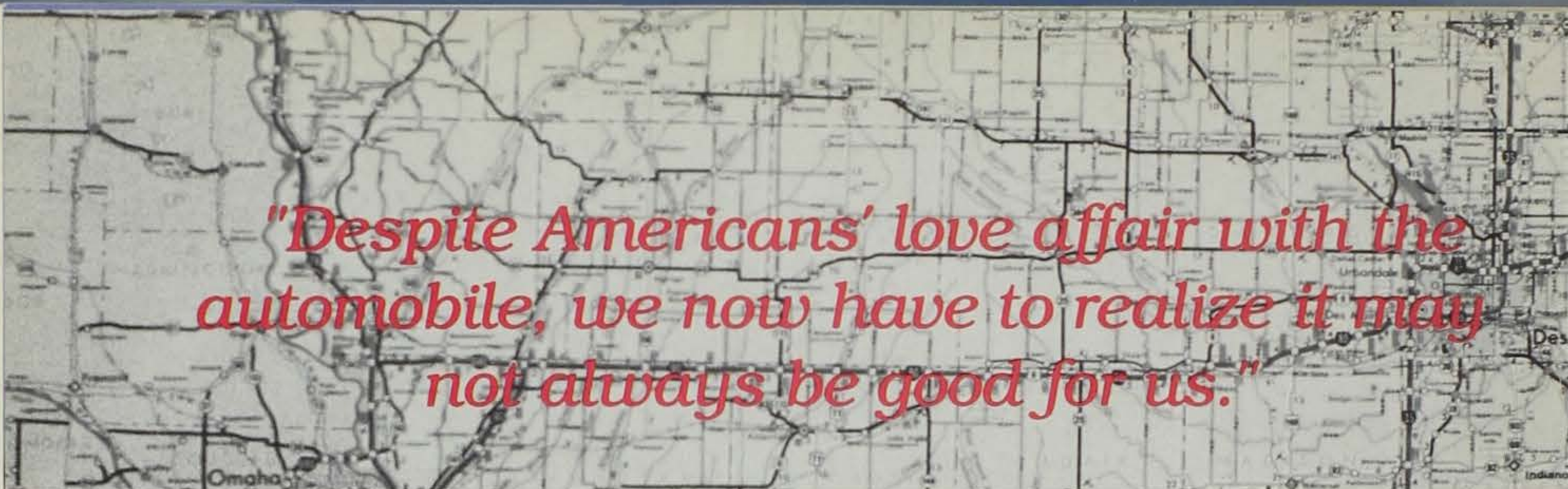
Life, liberty and the pursuit of mobility -- these are what Americans hold most dear. In terms of mobility, post World War II highway building accelerated the automobile-centered mentality we have come to enjoy and in fact, expect. This expectation has been self-fulfilling in

our "drive up" culture. We drive up to banks, restaurants and even churches. We can do everything in our cars.

Since distance is not an issue, it has become increasingly popular for individuals to live in a rural or suburban setting while commuting to work or

recreational events - often in single-occupant, privately owned vehicles.

Vehicle ownership is coveted by young and old alike. The ease of owning more than one vehicle affords families the mobility to work and play at dispersed locations and driving-



"Despite Americans' love affair with the automobile, we now have to realize it may not always be good for us."

age teens the luxury of personal transportation. Of the 135 million passenger cars registered in the United States, more than 1.8 million are registered in Iowa. This amounts to roughly one car for every 1.8 people or one car for every 1.2 licensed drivers in the state! Car registrations are on the rise despite Iowa's decrease in population over the past 10 years. Department of Transportation figures show that car registrations increased 26 percent between 1979-89 while state statistics show a two percent decrease in the state's population during this period.

The intense desire to own a car is only fueled by the state and federal governments' willingness to subsidize an automobile-dominated society. Iowa alone spent more than \$274 million on primary road construction in 1989. If you consider the past decade, this figure climbs to more than \$2.2 billion -- all spent on the state's highway system. Expenditures of our gasoline tax are used to finance the expansion and maintenance of these roads and do not provide for funding alternative transportation options. This limitation is costly to both the state and the public in terms of potential energy and dollar savings.

There are other costs of automobile ownership as well -- costs to local communities. According to Worldwatch Institute, about 40 percent of de-

partmental costs of needed services such as police, fire and rescue units is consumed for such activities as accident and theft investigation and traffic control. In terms of energy consumption, the transportation sector consumes 76 percent of the petroleum and 26 percent of all energy used by the state. This is significant for a state that imports 97 percent of its energy -- costing more than \$5 billion annually.

Part of the high consumption figure can be attributed to the low efficiency of vehicles owned and operated here. Iowa's vehicles average 12.4 miles per gallon (mpg), affording us the distinction of being the fifth *least* efficient state in the nation. The state's lower mpg may be the result of the number of Iowans driving older cars, which are not as efficient as the newer cars on the market.

New automobile efficiency has increased from an average of 14 to 27.5 mpg since the early 1970s. However, even as Iowans update their cars, improvements in efficiency may be offset in part by an expected increase in travel. The Iowa Department of Transportation estimates that the number of miles traveled by Iowans will increase about 18 percent from 1987 to the year 2010.

The cost of owning and operating a vehicle goes far beyond purchase price, maintenance, the dollars spent on our highway systems and the

energy dependency created by indiscriminate use of vehicles. The public is now learning the automobile is damaging an environment we assumed would last forever in a "safe" state. It is negatively affecting the air we breathe, the water we drink and our natural life support system. Despite American's love affair with the automobile, we now have to realize it may not always be good for us.

Did you know, for example, that an automobile averaging 18 mpg produces 21 pounds of carbon dioxide for every gallon of gas that it burns? This means that the 2.5 million cars and light trucks that roll across Iowa's highways are busy pumping thousands of tons of carbon dioxide into the atmosphere each year. By using fossil fuels in automobiles and industry, we have contributed to a 25 percent increase in the amount of carbon dioxide in the atmosphere since the 1850s.

Carbon dioxide is one of the greenhouse gases that has received a lot of publicity lately in terms of its impact on the environment. While naturally occurring greenhouse gases help keep our planet at a temperature suitable for life, humans have increased the amount of carbon dioxide above natural limits.

Greenhouse gases trap radiation in the earth's atmosphere. Scientists predict that increased CO₂ concentrations could lead to higher tempera-



tures and other global climate changes. Changing temperatures and rainfall patterns could have repercussions for Iowa's economic stronghold -- agriculture.

With so much at stake, it seems reasonable that we should reassess our obsession with the automobile. We should take steps to reduce dependence on the single-occupant vehicle. But, to do this will require a reorientation to alternate modes of transportation such as mass transit. As a nation we can learn from our European counterparts who "hold a lot of stock" in public transportation.

Most of the larger European cities have devoted parts of city centers to pedestrian zones and allow no vehicular traffic whatsoever. Local merchants have benefitted. Marcia D. Lowe of the Worldwatch Institute indicated that local commercial sales in these zones increased by as much as 25 percent, even when closed to cars.

In order for the United States to enjoy this same success however, we need to transform the way we think about the automobile. One of the surest ways to effect change is to reduce the current subsidies provided to single-occupant vehicles. Subsidies come in many forms such as funds available for building more roads and the availability of cheap gasoline. One of the most direct subsidies offered locally and nationally is free parking. Several studies have shown that if employees have to pay for their

parking, they begin to consider alternatives such as mass transit or carpooling more seriously. Given the history of increasing automobile use in this country, attempts at environmental and energy-conscious planning to reduce use of the single-occupant vehicles will be a challenge indeed. The task is compounded by Americans' reluctance to forgo the use of their prized possession in favor of a multiple-occupant alternative. The single-occupant vehicle often represents far more than a possession, it can be a symbol of status, wealth and the freedom to go at the mere whim of the owner. This sense is even underlined in the television commercial that boasts, "It is not just a car, it is your freedom." Any perceived constraint on the freedom of mobility will be met, at least initially, with much skepticism if not outright hostility. Change will only occur when the real costs of owning and operating the vehicle are more "expensive" than the alternatives. As the hidden costs of driving become more obvious and are transferred to the owner/operator, from the taxpayer, leaders may then have the needed leverage to begin to reprioritize policies which affect our transportation system.

As Iowa rushes headfirst into the '90s, the state must realistically assess what the next decade should bring in terms of an integrated, comprehensive

energy management plan for the transportation sector. Time for changes in the transportation system could not be better as federal transportation legislation is ready for an overhaul upon expiration in September of this year. "It is a once-in-a-generation moment in transportation history. There is a real sense of excitement here," says Stephen C. Lockwood, a Federal Highway Administration planning official.

While state and federal government organizations grapple with the immense task of setting a new transportation agenda, individuals can make a difference by beginning to wean themselves away from dependence on the automobile. In the meantime, people can assure improved energy efficiency by properly maintaining their vehicles and purchasing more efficient vehicles when replacement is necessary.


Overall, Iowa can overhaul its transportation policies to be consistent with its commitment to increasing energy efficiency and the environmental quality of the state. We must emphasize quality of life before mobility.

Ward Lenz is an administrative intern for the DNR in Des Moines.

Sharon A. Tahtinen is the transportation and planning supervisor for the department's energy bureau in Des Moines.



Springbrook Lake before renovation.



The Springbrook Lake Revival

"Driving up the road toward the campground, campers are rigging fishing gear and coming back from hikes through the woods. There are people swimming in the lake and sunbathing on the sandy beach. Across the 30-acre lake, an angler is casting from a rowboat toward the tree-lined shore, probing the water near the steep banks with a lure. Largemouth bass, crappies, bluegills, catfish and bullheads are taken at Springbrook Lake."

.....

by Rod Nelson

The scene depicted above was written by Glenn Moravek in the February 1972 issue of the *Iowa Conservationist*. Many drastic changes have occurred in the nearly 20 years since the article was written. Over time, the original 30-acre lake was reduced in size to about 14 acres due to heavy erosion from neighboring lands. However, the greatest change came in 1989 when the lake-related activities mentioned above came to an end to drain the lake for spillway reconstruction and lake renovation.

"King's Park" (later renamed Springbrook State Park) was established in 1926. The original park encompassed 114 acres of wilderness located seven miles north of Guthrie Center in Guthrie County. On November 11, 1933, the National Park Service established a camp for the Civilian Conservation Corps (CCC). The CCC company, in conjunction with workers from the Civil Works Administration, constructed the dam and building facilities around what is now Springbrook Lake. The size of the park also increased during this period to total nearly 300 acres. Today, Springbrook State Park contains 796 acres of rolling hills.

Park users have enjoyed outdoor recreation experiences involving the park and lake for more than 50 years. However, age took its toll on the spillway at Springbrook. To facilitate necessary spillway repairs, the lake was first lowered, and then drained during fall 1989. According to park ranger David Hebrank, the water level had only been disturbed once before when the lake was temporarily lowered to install a swimming and diving platform in the early 1960s.

Although DNR biologists and engineers knew silt deposition had reduced the

Jerry Leonard

size and depth of the lake, once drained, the magnitude of the problem became apparent. According to Dick McWilliams, DNR fisheries management biologist, fish habitat that may have been present in the lake

years ago was now gone, either due to decomposition or simply buried by the silt. In addition, shoreline habitat had all but disappeared.

To provide additional life for the lake, several steps were taken. The first were initiated during spring 1990 with the construction of three fishing jetties. These jetties serve two purposes. First, they provide additional shoreline angler access and second, they increase the amount of fish habitat along the shoreline. The jetties were faced with native fieldstone and a number of trees and brush piles were located within easy casting distance of them.

The largest step, lake renovation, began last fall. The contractors had to battle Iowa's frequently uncooperative weather for three seasons. But, as of publication time, the majority of the work had been completed. A total of 20,000 cubic yards of silt was excavated from the lake. Having much of the silt removed left an excellent opportunity to construct fish habitat structures across the lake bottom. Habitat development included construction of the jetties, a submerged island with embedded trees in the northern portion of the lake and placement of trees along the entire shoreline to provide shallow-water cover for fish. The park staff and a local

scout organization strategically placed more than 100 Christmas trees in several areas of the lake to provide additional habitat. Several rock reefs and brush piles were also implemented as the lake renovation continued.

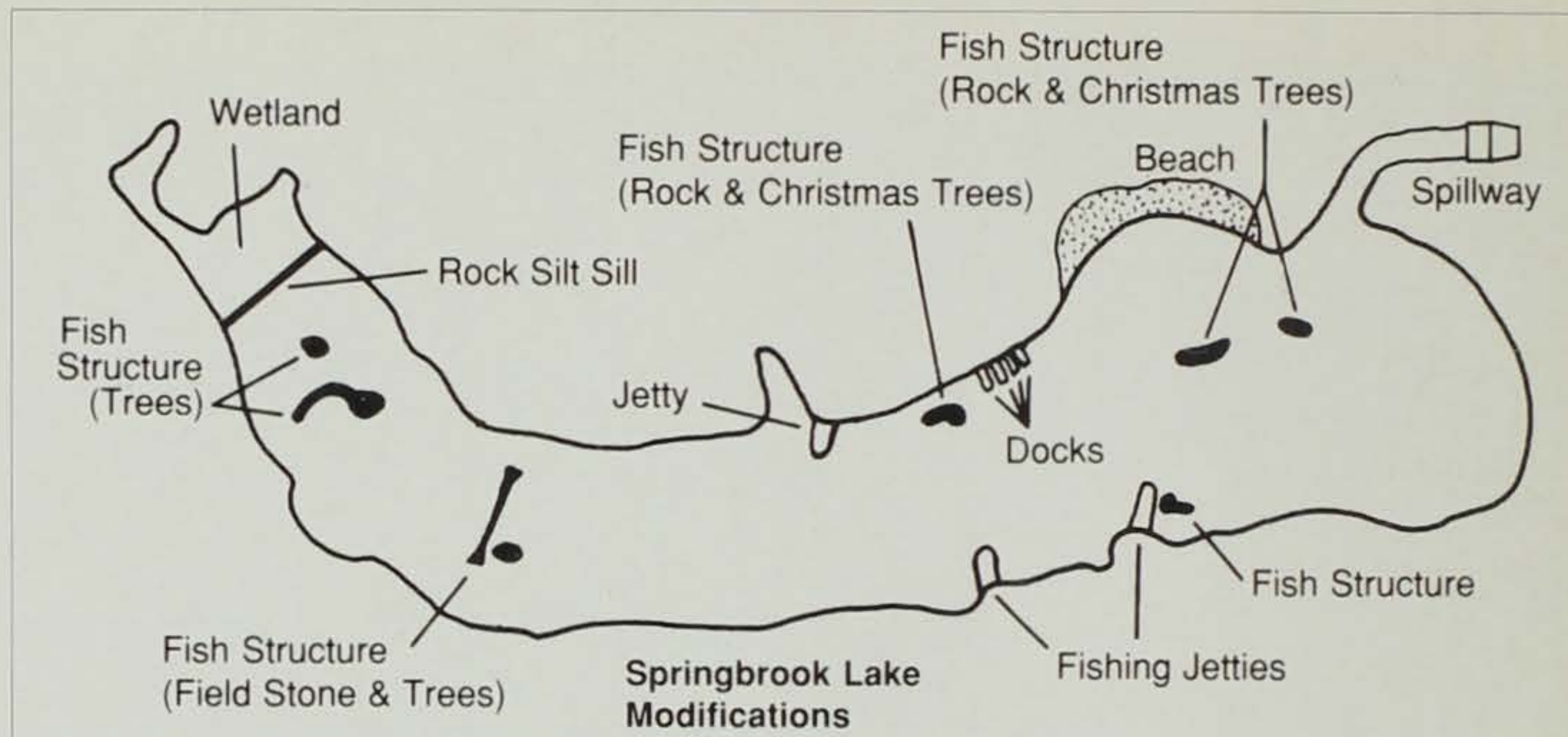
One of the primary goals of the renovation was to slow the aging process of the lake by reducing the amount of silt entering it. To do this, a 300-foot field stone silt sill was constructed across the north end of the lake along the major watershed. The sill will provide a settling area for silt and help prevent much of it from reaching the lake proper. In addition, shorelines were reshaped and reseeded, where possible, to reduce the shore incline, and silt ponds located along the northern portion of the lake were renovated to provide increased capacity for silt retention.

With the excavation procedures and the construction of fish habitat structures completed, fish stocking became a priority for restoring fish populations and angler success. Joe Schwartz, DNR fisheries supervisor, outlined the stocking procedure. Immediately following the closure of the dam gate to allow lake refilling, minnows were stocked. During June 1991, 1,400 fingerling largemouth bass will be stocked,

followed by 75 adult bluegills and 75 adult redear sunfish in July. A second stocking of 1,400 fingerling largemouth bass will be made during June 1992. Minnows and spawn produced by the bluegill and redear sunfish this summer will provide forage for the largemouth bass, and will also provide the base for both populations in the lake. An initial stocking of 700 fingerling channel catfish will be made in October 1991. Annual stockings of channel catfish are planned to maintain population levels. Completion of the stocking program will occur during June 1994, when 70 adult black crappie will be stocked in the lake. Fish populations are expected to develop rapidly, and bluegill and redear sunfish should be in good shape by late 1992 or 1993.

As a result of the renovation and construction of the much-needed fish structures and cover, easier lake access and a predicted successful fish production, anglers and other park users should reap the benefits for many years to come. The Springbrook staff would like to thank the many park users for their patience and continued support, and encourages all to visit and enjoy the rebirth of Springbrook Lake.

Rod Nelson is a park attendant at Springbrook State Park.



WARDEN'S DIARY

CHUCK HUMESTON

CAN I HAVE THIS FOR A PET?

One of the hazards of this job is taking wildlife away from people who wish to keep the animal as a pet. The hazard isn't the wild animal, it's the person who gets wild.

In most cases, a person's heart is in the right place. But, in most cases the animal was not abandoned to begin with and should have been left alone. Once in the home, the "helpless infant" becomes the family pet.

Sometimes, we get a call after the "cute little critter" has bitten or scratched or kicked or dragged the caller or the caller's children. There are times a person's care harms the animal rather than helps it due to a lack of expertise in animal care or rehabilitation. Trying to reason with a person convinced they are an expert leads to confrontations. Such was the occasion on the "Day of the Skunk."

The day started simply by acting on information that a person was illegally keeping a skunk as a pet. Neighboring officer Mark Edwards and I drove to the residence and found the proprietor, who we immediately noticed was not the least bit happy to see us.

Mark got to the point, telling him we were there to pick up the skunk he had taken from the wild. Immediately we were called various names question-

ing our heritage, intelligence and physical abilities. This being grade F on an attitude test, Mark asked for the skunk. We were told it was in the house with his friend, who had apparently picked up the infant skunk off a roadside. We asked our new friend to go in the house and bring out his companion and the skunk, and she would be charged with possession out of season. Livid by now, he came back out of the house exclaiming, "She ain't taking no ticket."

Marveling at how simple things get out of hand, we asked him if he owned the property, to which he answered "yes" with expressions strongly indicating "so what." We told

He walked up to us holding a small skunk and he began yelling obscenities even I had never heard before.

him we were tired of taking his abuse, and we were charging him with possession. He glared then yelled at us, turned around and ran into the house. Oh, what dedicated public service!

The door opened; he peered out. He walked up to us holding a small skunk and he began yelling obscenities even I had never heard before. Mark started writing the ticket, and the guy kept yelling. Every

officer has a point at which "no more" is reached. Mark had reached his. He looked the man in the eye and said, "@#*&!" I was wide-eyed. All was silent. The guy immediately became cooperative. Apparently Mark had put things in terms the man could understand.

As he started up again, I pointed at the skunk and asked what he had been feeding it. "Hamburger and water." Striking my forehead with my hand, I said, "Oh no, the electrolytes are in disproportion to the cardiovascular system, and the proteins are out of synchronization with the skeletal system, all of which could result in dehydration and deterioration of his overall physical condition, leading to cardiac arrest." The guy quieted down. Mark took me aside asking, "What did you tell him?" "I don't know," I answered, "but he's sure quiet isn't he?"

Mark issued the ticket, we loaded up the skunk, and to comments of "abuses of government power," we drove away. I took the skunk to a wildlife rehabilitator in Iowa Falls who pronounced it dehydrated and undernourished, but later successfully returned it to the wild. How did the case turn out? The legal system, feeling sorry for the guy, dropped the charges. Oh, brother!

It was about a year later when Mark called me wondering if I could pick up a fawn being illegally held as a pet. That became the "Day of the Deer," which is another story!

CONSERVATION

UPDATE

LOCAL GOVERNMENT ENERGY PROGRAM

As Mary Ann deVries of the Iowa Association of Municipal Utilities pointed out, "Increasingly, Iowa's communities are being called upon to do more with less."

There is a source of

make a difference in communities, according to Dean Schade of the League of Iowa Municipalities. "When you can reduce your energy reliance, you can put that money into other programs," he said.

After a successful pilot project, the Department of Natural Resources is now prepared to launch the program statewide. The program also is co-

State Association of Counties, the energy study will allow officials to "sit down and be able to see what they're losing and what has to be done."

The city of Knoxville had a technical analysis done on city buildings three years ago, according to city manager Dick Franc. Energy improvements recommended by the study "looked like a good idea back then. Unfortunately, due to other demands, the analysis sat on the shelf," said Franc.

Knoxville now has been able to obtain financing to make the improvements through the energy bank pilot project. "We saw that as an opportunity to take the information we already had, get the improvements in place and start saving energy and dollars," said Franc.

Cities and counties can make energy improvements and start saving money without dipping into operating budgets because of the program's financing procedures. First, the DNR offers a zero-interest loan to pay the costs of the energy analysis. Then, when a local government is ready to install the im-

provements identified through the study, the program offers a special financing arrangement. The energy savings cover the payments on the loan.

The financing program "fit our needs very well," according to Michael McCarville, mayor of Fort Dodge. Many energy improvements pay for themselves, he said. "However, it may take an initial investment of \$100,000. We're like most local governments. We simply don't have the money available. This financing program allows us to borrow the money from the state. We pay it back on a monthly basis, through the energy savings we obtain because of the energy improvements."

"Local governments have the responsibility to see that the taxpayer's money goes as far as it can go," said Franc. "This program aids in that."

For more information, contact Shashi Goel, Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034 (515)281-8681.

—Reprinted from Iowa Energy Bulletin, May/June 1991.



Iowa Local Government Energy Bank Program

savings that local governments may have overlooked until now. That money is locked up in energy bills for Iowa's city and county facilities. A new state program will give Iowa local governments the key to unlock the treasure chest and put energy savings to work in Iowa's communities.

The Iowa Local Government Energy Bank Program provides technical and financial assistance to make cost-saving energy improvements. Tapping into energy savings can

sponsored by the League of Iowa Municipalities, the Iowa State Association of Counties, the Iowa Association of Municipal Utilities and the Department of Economic Development. It follows on the heels of similar programs making energy improvements in Iowa public schools and hospitals.

The DNR's streamlined processes make it easy to obtain an energy study that points out where improvements need to be made. According to Bob Mulqueen of the Iowa

Another Era Ending

A modest man, steady as a rock, kind to one and all, possessing an extremely wide range of knowledge and often bizarre sense of humor, has also been an important part of natural resource management in Iowa in the last half of this century.

Deputy Director Bob Fagerland is retiring from the DNR this summer. As it is for much of the dedicated staff of the agency, he considers his work here as much more than just employment. "This outfit has been very good to me. I have been darn lucky in getting some great jobs," he reflected recently. The reverse is true as well. Bob Fagerland has been very good to the department and it has been the good fortune of the state to have him available.

It was 34 years ago in the spring that Bob took a job with the Conservation Commission, planting trees and shrubs.

Growing up in Clinton County and developing his own, personal interest in the

outdoors, Bob took the tree planting crew job "for fun" while he was waiting to become a high school teacher in the fall. He had just graduated from the University of Iowa with a degree in mathematics.

"Job requirements have become so specialized and candidates so highly educated in technical fields, I doubt I could be hired by the department under today's standards," he said. "It takes much more than fondness of the outdoors and desire."

About six months after he started planting trees, Bob chose to become a conservation officer instead of a teacher.

"While I enjoyed my five years as an officer in the Dubuque County area, it became apparent to me that there might be other employment in the agency more fitting for me. For some reason, I can't really explain it, I just didn't have the desire to write as many citations as it probably takes to do that job right. I probably spent too much effort in all of the other duties of a game warden because my ticket tally was pretty low," said Fagerland.



Then in 1962, another break came. The Conservation Commission was increasing its land acquisition program and Bob was asked to change jobs, move to the Des Moines headquarters, and start buying land.

"Some of the early land I bought was \$10 to \$15 an acre — small woodlots in southern Iowa that years earlier were kept as a source for firewood. The absentee landowners were eager to get rid of the these parcels. I really felt that we were doing a service for the landowners and the future of habitat in Iowa."

Bob eventually became superintendent of an active land acquisition section and stayed until 1979, when Bill Brabham became the new direc-

tor of the department and asked Bob to become his deputy. Bob obliged, but in two months, Bill died suddenly of cancer and Bob became acting director.

Throughout 1980, Bob was a stable force leading the Conservation Commission while his seven commissioners labored to hire a new director. Bob did not want the job. He did want to keep the department functioning as best as it could until a director was found. In recognition of his abilities to do this, the commissioners did not feel hurried or under pressure, taking a full year to find Larry Wilson, who became director in 1981.

For the last 10 years as deputy director, Bob's primary

CONSERVATION

UPDATE

continued from page 21

responsibilities have been working with the Legislature and handling citizen complaints. Many new and successful programs have been started due to legislation that he helped through the system, including hunter safety, the chickadee checkoff, and the protected water areas program. As the official "Complaint Department," he has assured that every credible concern voiced by someone from outside the department has been investigated and resolved to the satisfaction of those concerned.

Now, in his last year, Bob has devoted most of his time in one of his previous areas of expertise — land buying. He has led the agency effort in the Brushy Creek area, south of Fort Dodge, acquiring 1,750 acres from willing sellers. The Legislature directed the DNR to buy this additional land for the Brushy Creek Recreation Area to assure that ample timber resources would remain

in the valley after a 600-acre lake is created in the next few years.

In his long career, Bob has bought land for \$10 an acre and for 200 times that amount. He saw the pheasant population decimated in northern Iowa, then build up in southern Iowa, only to reestablish itself in northern areas again. Deer, turkey, grouse and partridge populations have all been reestablished or their ranges have dramatically expanded during his tenure. He witnessed the construction of four federal flood control reservoirs, dozens of marshes and lakes, and hundreds of public access points to these waters. Bob was around when fishery management and hatchery techniques made giant leaps forward, resulting in much improved angling throughout the state. Coupled with improvements in transportation and more leisure time, he strongly believes that the "good ole days" of hunting and fishing are going on right now.

Lucky for him; now he has the time to enjoy it.

Upcoming NRC, EPC and Preserves Board Meetings

The dates and locations have been set for the following meetings of the Natural Resource Commission, Environmental Protection Commission and the Preserves Advisory Board of the Iowa Department of Natural Resources.

Agendas for these meetings are set approximately 10 days prior to the scheduled date of the meeting.

For additional information, contact the Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034.

Natural Resource Commission:

--July 11, Corning
--August 1, Charles City

Environmental Protection Commission:

--July 15-16, Des Moines
--August 19-20, Des Moines
--September 16-17, Des Moines

State Preserves Advisory Board:

--September 10, Des Moines

State Park Week 1991

State Park Week 1991 will be held on June 9-15. Each state park and recreation area will feature a variety of special events and programs. Activities will range from campground speakers and slide programs to fishing contests, hay rack rides, and drawings for prizes. The seventh annual State Park Week is a way to get people to come out to their favorite state parks as well as try out some different ones.

The DNR invites all to come out and see what Iowa's state parks offer. Contact park rangers for specific dates and times for events in each park.

Free Fishing Days in Iowa

Sport fishing license requirements have been waived in Iowa to help promote National Fishing Week, June 3-9, 1991.

In Iowa, no license is required of residents for fishing June 7-9, 1991.

All laws regarding size and bag limits as well as other fishing regulations must be followed. Anglers should obtain a copy of the state's fishing regulations for further information.

Enter Potential Record Fish in Iowa's "Big Fish Registry"

Anglers are reminded to enter any large fish, as well as released fish, caught in Iowa in the Department of Natural Resources' "Big Fish Records Registry." Fish meeting minimum weight or length requirements are eligible for entry, and anglers will receive a shoulder patch and certificate.

Extra care should be given to possible new state record fish. "Lack of knowledge about the state records often spells the difference between a new record and just another big fish," said Marion Conover, fisheries management supervisor for the DNR. "Sometimes several hours or even days go by between the time a fish is caught and the time it's officially weighed. In some cases, this doesn't make much difference, but under certain conditions, a fish will lose a substantial amount of weight."

The official rules for submitting potential record fish and large fish are as follows:

- The fish must

have been legally caught in Iowa's fishing waters.

- New all-time record fish must be examined and verified by DNR personnel.

- One witness must attest to the length or weight of the fish to the nearest ounce on scales legal for trade. Length is measured from the tip of the snout to the tip of the tail (total length).

If there is some doubt in species identification, the angler should contact the nearest DNR fisheries representative in the area for verification.

An entry blank, found in the 1991 Iowa Fishing Regulations brochure, should be mailed with a color slide or photo to Fish Records, Iowa Department of Natural Resources, Wallace State Office Building, Des Moines, Iowa 50319-0034. The deadline for entry in the 1991 records is Jan. 15, 1992.

The top 10 fish caught and the released of each species, as well as the all-time record fish, are published each year in a spring issue of the *Iowa Conservationist*.

CLASSROOM CORNER

by Robert P. Rye

When you take a walk and observe wildlife behavior, you may have noticed that wildlife species have exceptional sensory perception. Animal senses are noteworthy compared to humans -- consider a coyote's nose, a turkey's eyesight or a deer's ears. Don't be discouraged though -- humans are sensitive when it comes to taste and seeing colors.

Look at the various animal activities below and match them to the list of senses.

- | | |
|------------|--------------------|
| a. Touch | d. Sight |
| b. Hearing | e. Electrosensory |
| c. Smell | f. Thermoreception |

1. Snakes are able to detect microscopic particles left by a passing mouse.
2. Buzzards and vultures find carrion (dead animals) even when it is out of sight.
3. Tom turkeys can fly from a roost to within a few feet of where a hunter sits calling.
4. Sharks can find prey fish by a weak electrical field that travels in salt water.
5. Ticks have sensitive thermal cells in their front legs that are stimulated by temperature changes as small as .9°F.
6. Whirligig beetles and water striders avoid collisions by using tiny hair receptors.
7. Fish and frogs have lateral lines which detect water displacement caused by a predator's approach.
8. Using their sharp ears and opening their large eyes wide enough to gather light, owls are capable of catching mice in almost total darkness.
9. The compound eyes of flies enable them to see in several directions at once.
10. The whiskers of catfish are able to find food in turbid water or even food hidden in the sand.

ANSWERS:

1. C 2. C 3. B 4. E 5. F 6. A 7. A
8. B and D 9. D 10. C

COUNTY CONSERVATION

THE MONARCH BUTTERFLY

Article Larry W. Totton
Photos by Ron Johnson

The monarch butterfly is a native to North America and is limited primarily by the number of milkweed plants in any given location. The insect's range continues to expand around the world within the latitudes of 45°N and 45°S. It reaches long distances overseas by attaching to ships and cargo. It avoids flying in darkness and cannot rest on water for more than 20 minutes.

The monarch, named after the Prince of Orange who became King William of England,

is the only butterfly proven to be a true migrant. By placing small adhesive tags on the wings of monarchs, researchers have discovered the flight paths of the insects and their overwintering sites in the Cross Mountains of Mexico.

Monarchs from Canada and northern states east of the Rockies fly southwest to Mexico, beginning in late August. Those which return north in spring months lay eggs and die before the end of summer, never migrating south a second time.

Although the butterflies fly south individually, they cluster together during cool evenings. A particular site or plant seems to be chosen, usually by its dominance in the landscape, often

near a large body of water and especially on peninsulas which extend southward. One monarch chooses a place to roost on the lee side of a plant. It is somehow able to attract others to rest along side.

Roosting areas can often be located by watching the flight path of individuals leaving a flowery field before sunset. Clusters are sometimes easily collected the next morning if conditions remain cold or stormy. In central Iowa the large clusters of 50 to 500 monarchs are not as common as tagging researchers would like, though the monarchs are very plentiful in flight and around flowery fields during the last week of August and the first two weeks of September.

Monarchs are tagged by holding the butterfly with a thumb above and finger below the body, the wings stay open. The person's other thumb and forefinger gently rub scales from the upper and lower surfaces of the wing where a tag is to be placed. The tag is then folded over the front edge of a forewing. The butterfly is released with its tag showing an individual identification number printed on the top side and an address underneath.

In Polk County, we have been able to capture large numbers of monarchs in a short period of time by concentrating on fields with thistles, wild sunflowers, alfalfa and fall asters. The Polk County Conservation Board has recorded an average of 370 captures per year since 1978. Some years as few as 26 have been tagged; in 1978, 1,575 were tagged. Four of Polk County's tagged monarchs have been found later by researchers in Mexico. It takes a monarch 4 to 10 weeks to fly to central

For more than 10 years, individuals in Polk County have watched and helped tag an average of 370 monarchs a year in county parks, outdoor classrooms and backyards. ▼



Roosting areas can be located by watching a monarch's flight path leaving a flowery field before sunset. ►

Butterfly gardens such as this one attract monarchs as well as many other species. These gardens not only add color to the landscape, but needed habitat for these beautiful insects. ▼



Mexico from the U.S. or Canada, some having to fly 2,000 miles.

Why does the Polk County Conservation Board have employees tagging monarchs? For one month out of each year, this is a way for citizens of the county to become personally involved with nature. Schools, scouts, garden clubs and just passers-by have watched and helped tag monarchs for more than 10 years in county parks, outdoor classrooms and individual backyards.

If you find a tagged monarch, please let it fly on after recording its number. Write to the address on the tag which reads, "Report

number to Zoology, University, Toronto, Canada." Volunteer researchers receive new tags and recapture information from Dr. Urquhart of the Zoology Department at the University of Toronto. Only a few new volunteers are accepted to help each year in Canada, Mexico and the U.S.

For more information on monarch tagging, contact Larry Totton, Jester Park, Granger, Iowa 50109.

Larry W. Totton is a naturalist with the Polk County Conservation Board.

CALENDAR

JUNE 15

Great Annual Springbrook Park Bike Ride (GASP). A 40-mile bike ride beginning and ending at Springbrook State Park. For more information, contact David Hebrank, Springbrook State Park, Rte. 1, Box 49, Guthrie Center, Iowa 50115, (515) 747-3591.

JUNE 20-23

North American Fur Taker Rendezvous held at the Dubuque County Fairgrounds. Activities include education demonstrations, world trap setting contests, fur style show and games. For more information, contact Elaine Schwarzhoff, Route 3, Box 175 Manchester, Iowa 52057 or call (319)927-5958.

JULY 14

Cedar River Festival.

Canoe float, July 13; arts and music festival, July 14. For more information, contact the Cedar River Festival office, P.O. Box 114, Cedar Falls, Iowa 50613.

JULY 20-21

Ft. Defiance Rendezvous. The rendezvous features primitive camps from the early 1800s. Events include black powder rifle shooting, tomahawk and knife throwing and a buffalo feed. For more information contact Gwen Prentice, Ft. Defiance State Park, RR 2, Box 152, Estherville, Iowa 51334, (712) 362-2078.

I think about the anglers I know and cannot picture any as being typical. Diverse -- that is a much better word to describe the Iowans who enjoy fishing a multitude of lakes and streams for a multitude of fish species. Kids, oldsters, male, female, wealthy, poor -- little distinction is shown as these anglers head for their favorite fishin' hole.

Of course one can use statistics to characterize an average Iowa angler, and the DNR has statistics from a telephone survey conducted in 1986. From the survey we find that an average licensed Iowa angler is 43 years old, has an annual income of \$27,000, goes fishing about 30 times a year and catches an average of three fish per trip, and this average angler is 70 percent male. Furthermore, this composite angler spends \$156 per year on fishing tackle, boat fuel, food, lodging and bait.

But enough of these averages. None of us wants to be averaged and we all know there really is no such thing as an average or composite Iowa angler. However, as an agency involved in providing a service -- in this case recreational fishing -- it is important to know who the customers are. What are their wants and needs? Is the DNR meeting them? In what areas can improvements be made?

When I was a youngster it seemed that needs were less stringent. Or maybe that's just my recollection -- time tends to distort the past. But,

Profile of an Iowa Angler

anyway my father and I were perfectly happy with a mess of yellow perch caught on a cold-in-the-morning-but-warm-in-the-afternoon October fishing trip to our favorite local, shallow prairie lake. Of course the trip was made more memorable if we caught enough for our family in addition to freezing some for use in the winter, particularly around Christmas. But, there were those days when catches were sparse and fish were smaller than we liked. Even these trips I remember as some pretty good trips. Maybe we were just easy to please.

But, as the saying goes -- times change, and technology has made a big impact upon angling. Many anglers now are outfitted with extremely sophisticated and expensive equipment. Likewise, competitive fishing for largemouth bass, walleye and crappie have developed over the years with high expectations for excellent fishing. These groups, although a small percentage of the fishing clientele in Iowa, generate a large revenue in the state and are vitally interested in DNR fisheries programs (see "Contest Fishing," page 10).

At the opposite end of the spectrum are those people who fish infrequently, perhaps only purchasing a license every second or third year. Their equipment, by most people's standards, would be, at best, meager and

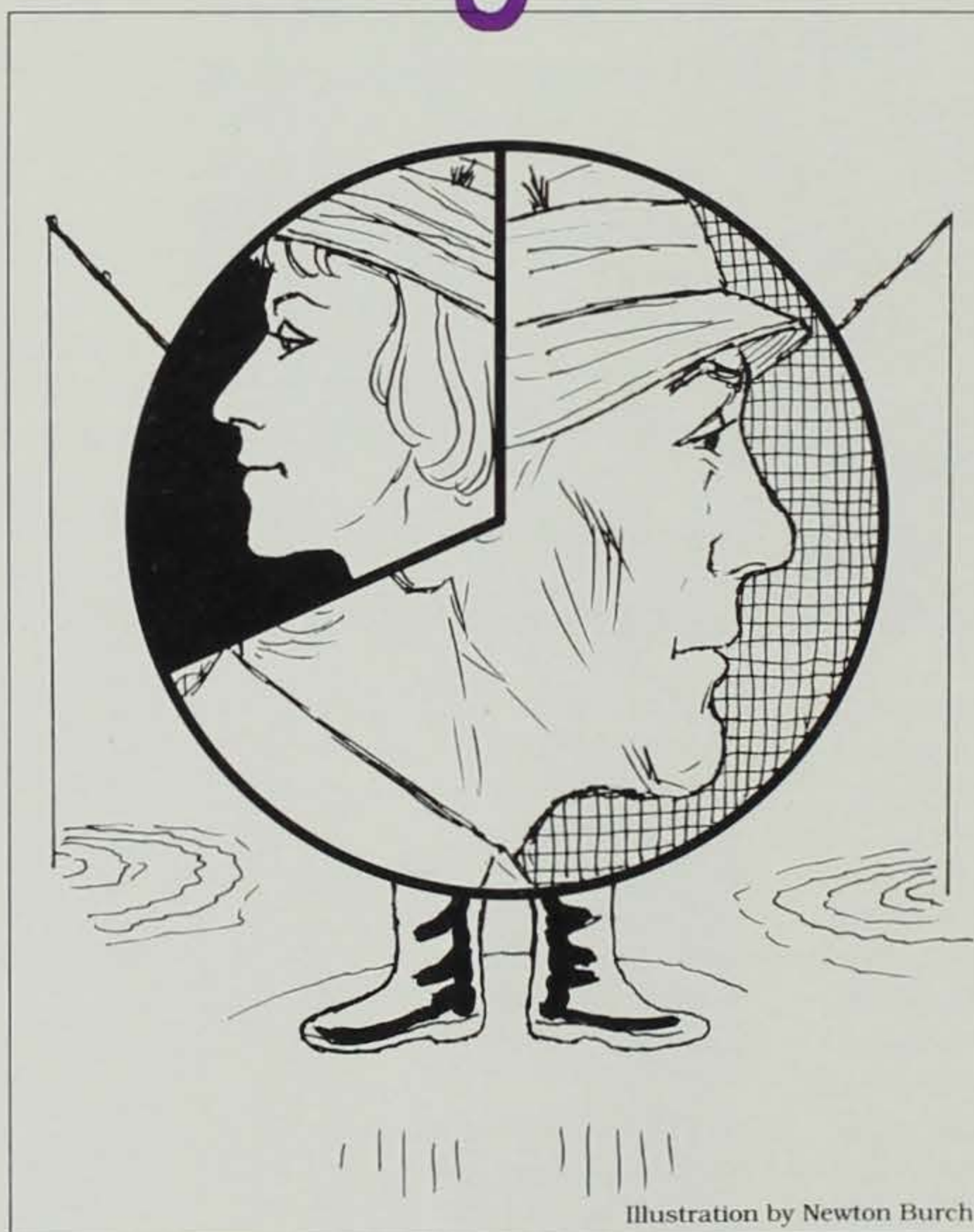


Illustration by Newton Burch

by Larry Mitzner

shoddy; correspondingly, their catches are far less than the "average" angler. They might include the grandparent who has not fished for years and yet wants to take his grandchildren fishing and maybe at the same time relive a few memories. These anglers, even though a primitive lot, are also a part of the fishing clientele and should not be ignored.

And then there are the incessant anglers, who buy an \$8.50 license and get every nickel's work out of it. I know several such individuals, many of them are retired and use fishing as a source of meat for the table, as well as a relaxing retirement pastime. One such gentleman I know fishes daily except for annoying interruptions such as weddings, graduations and domestic chore-days for shopping or washing. These people are usually less mobile and fish a few choice lakes or streams in the local vicinity. They become very proficient, catching a large number of fish for the effort expended, mainly because they learn the fishes' habitats and water so well. Indeed, they become fishing experts, not necessarily because they read all the trade magazines or have the most sophisticated equipment. They are experts simply because of the knowledge gained through continued and consistent fishing. Practice makes perfect. And amazingly their catches, although high, are not wasted. The fish are used as part of the grocery budget or given away to those with less time to fish or less talent at fishing.

Then, there are the no-good niks -- those people who opt to fish without a license, catch and keep sublegal-sized bass or walleye, catch and keep more

than their daily limit, fish illegal trotlines and in general get away with what they can with no regard for the law. Also, in this category one could put those individuals who do not necessarily break the law, but tarnish the true spirit of angling. How about those who leave gates open at a farm pond, and those who have no respect for boat ramp etiquette? This group of anglers exist, but they are in the minority. Educating kids to respect the fishery resource as well as fellow anglers is a must in order to keep the no-good-nik crew to a minimum. And the fear of being nailed with a citation will always provide motivation to, at least some degree, abide by fishing, boating and safety regulations.

What other groups of anglers are there? Just as many as you can think of and care to describe. The important thing to remember is they, as groups, and individuals, comprise the anglers of Iowa, and in effect make up the total group of customers which the DNR must satisfy.

And what are the wants and wishes of the Iowa anglers? Again, the answer is diversity. The telephone survey of 1986 showed a preference for catfish (22 percent) followed by largemouth bass (18 percent) and walleye (16 percent). However, crappie, bluegill and bullhead had a combined rating of 25 percent. This last group caught about 60 percent of the fish in Iowa in 1985.

And where do Iowa anglers fish? Well, 46 percent fish on rivers and of this, 16 percent on the Mississippi River. The remaining fishing occurs mainly on public artificial lakes (21 percent), natural lakes (12 percent) and farm ponds (13 percent).

The fisheries bureau staff is listening to anglers literally on a day-to-day, one-on-one basis all

over the state, be it a telephone survey call, a local club meeting, letter or visit at the boat ramp. One thing is certain -- a diverse fishing public can be matched only by listening and providing a diverse fisheries program which includes hatcheries, habitat improvement, adequate lake and stream access, law enforcement and education.

The idea of a fisheries program at work was best shown to me this summer when an old man and his grandson were sitting on the bank. As I listened I could tell, first of all, grandpa was a good angler, second he was teaching the youngster the tricks of the trade and third, they were having a really good time at it. I was particularly impressed when he explained the importance of releasing the small bass the youngster had just caught. Grandpa caught the next fish, a channel catfish, and he explained to the boy that these were stocked by the DNR and had they not been stocked, there would be no channel catfish in the lake.

Iwondered about surveys and averages and such, and all the information that is needed to help manage the fisheries resource in the state. How would one categorize and profile this pair? Many ways I am sure, but for right now I would say -- just having a great time. I could tell by the way the boy was giggling and skipping as they headed up the hill with their mixed bag of bluegill and a few channel cats.

Larry Mitzner is a fisheries research biologist for the department in Chariton.

Canada geese nested throughout Iowa prior to European settlement and flocks of these birds filled the autumn azure in sky-darkening numbers. These were large geese.

Old pictures from the late 1800s and early 1900s show geese weighing as much as 16 pounds and tales are told of birds as large as 20 pounds. These large geese nested on marshes and rivers from eastern Montana and Colorado east to Michigan and Ohio; from southern Alberta, Saskatchewan and Manitoba to Kansas and Missouri. But the combination of overexploitation from year-round hunting and egg gathering and wetland drainage took a serious toll on this wild population. By 1907, nesting Canada geese were referred to as uncommon in Iowa and shortly thereafter became extirpated from the state. It was not long after that they disappeared from the rest of the Midwest and southern Canada.

They had become extinct, never to return to the Midwest. Or at least that is what many people thought until Harold Hanson, a biologist with the Illinois Natural History Survey, discovered a free-flying flock of



LAND of the GIANTS

giant Canada geese wintering at Rochester, Minnesota in 1962. That discovery rekindled the hope of returning this majestic bird to its former nesting range.

In response to the demand by both the hunting and non-hunting public to restore these large geese to their former breeding range, the Iowa Department of Natural Resources initiated a program in 1964 to reintroduce giant Canada geese to the state. The giant Canada goose, *Branta canadensis maxima*, is the largest of the 11 currently recognized races of Canada geese. All Canada geese look basically alike, but

differ in stature. Canada geese range in size from the small cackling Canada goose, weighing only three to three and a half pounds, to the giant Canada goose, with adult males commonly weighing more than 12 pounds, so care had to be taken in choosing stock for this project.

To ensure that the original geese were being reintroduced, the program was initiated with the purchase of 16 pairs of giant Canada geese from goose propagators that could trace the origin of their flocks to geese or eggs taken from the wild in northern Iowa or southern Minnesota. These 16 pinioned

Article by Guy G. Zenner and Theodore G. LaGrange
Photos by Lowell Washburn

pairs were held in a 14-acre pen on the shore of Ingham Lake in Emmet County in northwest Iowa. The geese were fed year-round and artificial nest structures were installed with ramps to provide these pinioned geese access to safe nesting. Nest structures were also placed on surrounding wetlands with the hope that free-flying geese

enced at Ingham Lake, in 1971 the reintroduction effort was expanded by transferring 12 adult pairs from the Ingham flock to a 15-acre pen at the Kettleson Hogsback Wildlife Management Area just a half-mile west of Spirit Lake (Spirit Lake flock). That same year, 11 adult pairs were transferred from the Ingham flock to an 11-

(Ingham, Spirit Lake and Ruthven) were only 15 to 25 miles apart, survey results have been combined for these flocks over the years. Between 1971 and 1980, the northwest and Rice Lake goose flocks grew dramatically and Canada geese greatly expanded the nesting range. Numbers of nesting pairs and young fledged from the northwest flocks increased at the average annual rates of 23 percent and 21 percent, respectively, between 1971 and 1980. The Rice Lake goose flock, although still young, was also increasing rapidly. By 1980, more than 1,600 nesting adult Canada geese were present in northwest and north-central Iowa.

In the mid 1970s, the DNR initiated a program to reintroduce

Canada geese to south-central Iowa. According to Harold Hanson's history of these Canada geese, a few giants nested in this part of Iowa in the early 1800s, and it was felt the abundance of artificial farm ponds in the southern half of the state would provide adequate nest sites.

In 1977, two new penned goose flocks were established in southern Iowa: one on the west end of the Rathbun Reservoir near Chariton in Lucas County, and another at Green Valley Lake near Creston in Union County. A third penned flock was placed on Bays Branch Wildlife Management Area near Panora in Guthrie County in 1978. Large goose refuges were established around the Green Valley and Bays Branch flocks and in 1980, all the public lands associated with the Rathbun Reservoir were closed



would soon be using them. For the first two years, nearly all young produced were clipped and held in the pen to increase the flock size. In 1966, some geese were allowed to free-fly and in that same year, the first nest of a free-flying goose pair was discovered on East Slough in Emmet County near Ingham Lake. To protect free-flying geese until they reached reproductive age, a 97-square-mile area, including all public and private land surrounding the Ingham Wildlife Management Area, was closed to Canada goose hunting in 1967.

The number of goslings fledged by the Ingham flock increased each year, reaching 144 by 1970. In that same year, Canada geese were observed nesting on six different nearby wildlife areas, all within Emmet County.

Given the success experi-

acre pen on the Smith Slough Wildlife Management Area, three miles northwest of Ruthven (Ruthven flock). Large Canada goose refuges were also established around both these flocks. The goal of establishing these new flocks was to accelerate the expansion of nesting Canada geese into unoccupied wetland habitat in northwest Iowa.

To reintroduce Canada geese to the eastern half of Iowa's prairie pothole region, another penned flock, consisting of 13 pairs, was established at Rice Lake in north central Iowa in 1972). These geese came from the Ingham flock as well as goose propagators that could trace their stock back to geese or eggs taken from the wild in northern Iowa or southern Minnesota. A 112 square-mile Canada goose refuge was also established around Rice Lake.

Because the northwest flocks

to Canada goose hunting to protect young geese. In 1979, the goose flock at Green Valley was moved 15 miles west to Lake Icaria near Corning in Adams County and a new goose refuge was established around the lake.

During the 1980s, the four original goose flocks grew dramatically and the nesting range of the Canada goose in Iowa continued to expand. Geese were so numerous on some wetlands in northwest Iowa that they began to be a nuisance for farmers planting adjacent croplands. As depredation problems developed, DNR wildlife management biologists began assisting landowners in controlling the geese grazing on their croplands. This goose depredation control program, although somewhat costly, did reduce the number of problems and allow goose flocks on other marshes to continue to grow. In addition, some refuges were reduced to allow hunters

to harvest more of these locally raised birds.

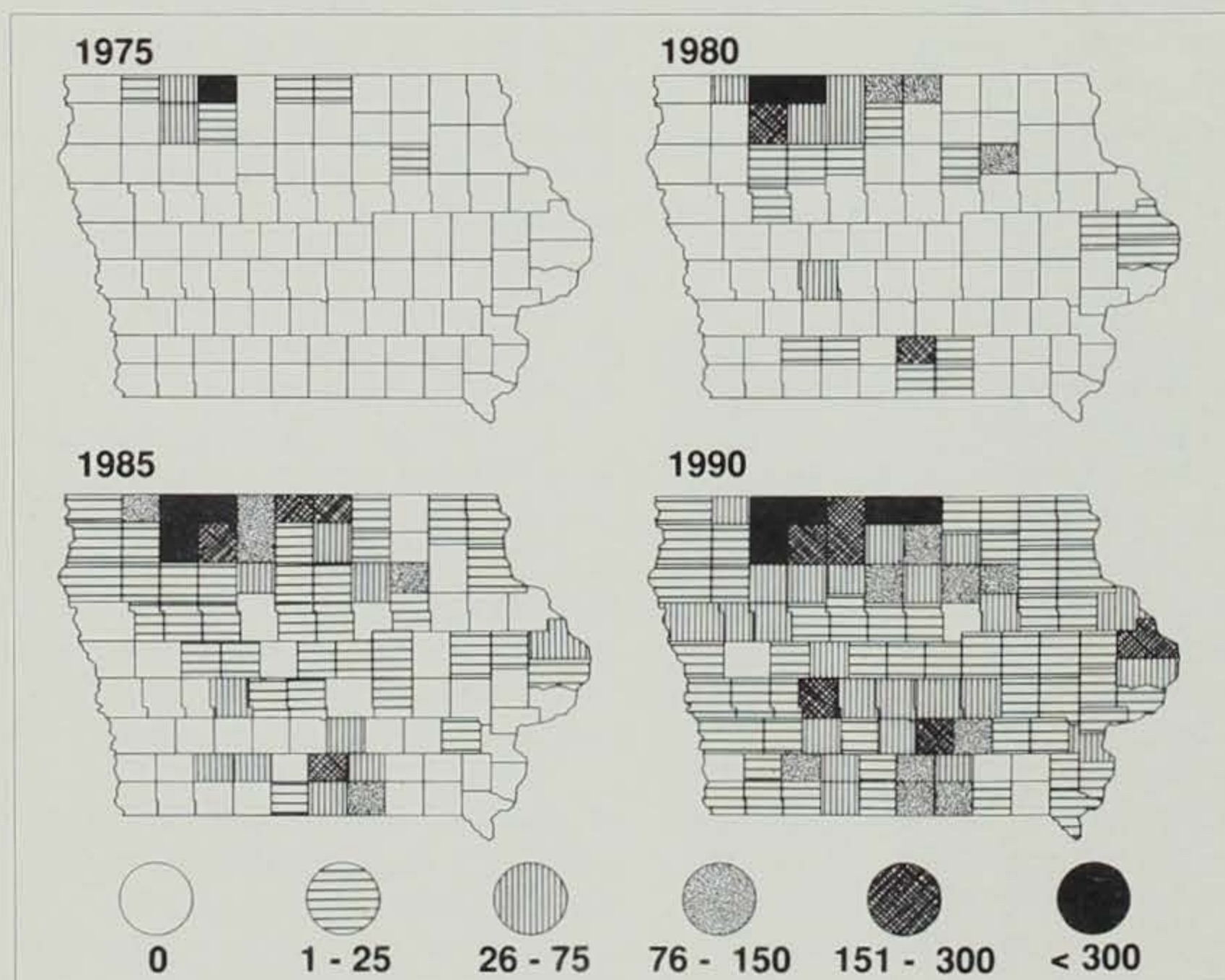
Another program that developed in response to goose depredation complaints but which yielded multiple benefits for all Iowans, was the goose transplant program. In 1983, the first year Iowa wetland habitat produced more than 5,000 fledged geese and hosted nearly 10,000 geese from the summer, the DNR initiated its transplant program. The transplant program had two goals -- to establish nesting geese in parts of Iowa lacking giant Canada geese and to remove geese from areas where high populations were causing depredation on private croplands. These two goals were met by moving flightless young-of-the-year geese with a few adult pairs to distant release sites, primarily in southern Iowa. From 1983 to 1990, 3,794 Canada geese were captured on wetlands primarily in northwest and north-central Iowa. They were banded and re-

leased at 28 different locations in 25 counties in Iowa.

It was hoped that these young geese would come back to nest at the release sites where they learned to fly, rather than to the marsh where they hatched. Neck collar observations of these transplanted birds confirmed that this did indeed happen and in some cases successful nesting occurred within two years after release. A good part of the expansion of nesting Canada geese to new counties in southern Iowa has been due to this program.

Also, during the 1980s, two new flocks were established outside Iowa's prairie pothole region. In 1984, a penned flock was established at Green Island, near Bellevue on the Mississippi River floodplain, in Jackson County. A 46-square-mile refuge was later established around the Green Island wildlife management area in 1990. Another penned flock was established in 1987 on the Missouri River floodplain at Badger Lake, northwest of Onawa in Monona County. A 36-square-mile Canada goose refuge was established around this flock, but this will very likely be expanded to 200 square miles by this fall.

During the first half of the 1980s, the northwest goose flocks continued to grow by an average of 12 percent and 10 percent for fledged goslings and nesting adults, respectively. But during the last half of the decade, severe drought plagued the region and caused goose production to tumble resulting in an average loss of nine percent and seven percent for fledged young and nesting adults, respectively. In contrast, the Rice Lake flock continued to hold its own, still increasing by an average annual rate of 29 percent, even during



▲
Distribution of adult nesting giant Canada geese by county within Iowa for the years 1975, 1980, 1985 and 1990.

the drought. Overall, the state population dropped for two years due to very poor production for the northwest flocks, but rebounded in 1990 because the Canada goose production in other parts of the state cancelled out the loss in production observed in the northwest region. In the past decade, the overall state Canada goose population has increased at an average annual rate of 12 percent.

Along with this increased population have come increased opportunities to harvest the big geese. Refuges for the early flocks have been reduced to a fraction of their original size and the chance of bagging a big Canada on opening day is many times greater than it was just a decade ago. Canada goose harvest has increased quite nicely during the last half of the 1980s and will very likely continue to increase with the growing population. In 1989, a record harvest of 19,800 Canada geese was recorded -- more than one goose per waterfowl hunter. This is a far cry from the one goose per 10 hunters recorded for the 1960s.

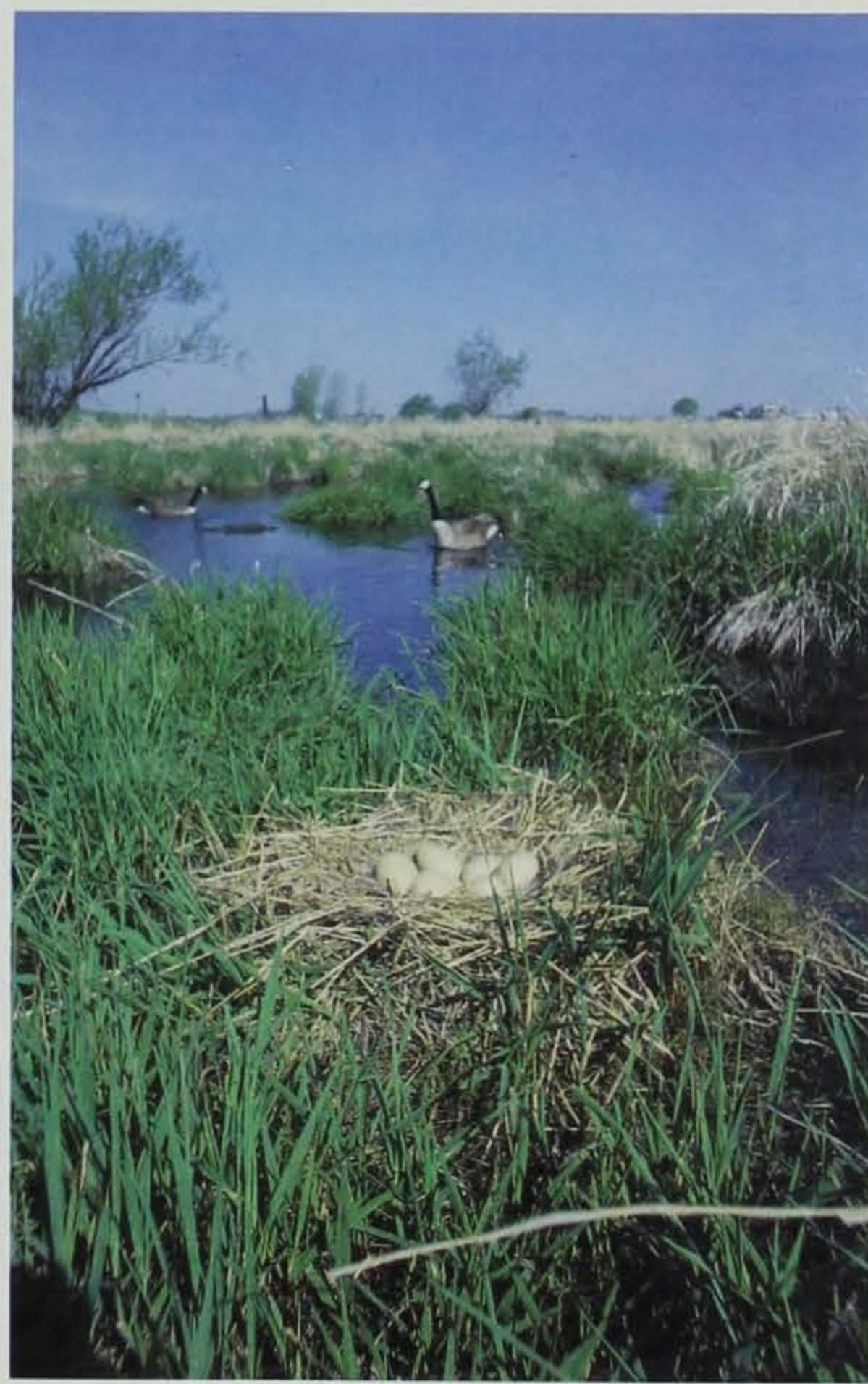
Apparently, despite this increased harvest, local flocks have not been hunted too hard. Band recovery data indicate that direct recovery rates (the percent of the banded birds shot the fall right after they were banded) are well within the ranges the populations can sustain. The large refuge system now in place across the state appears to be providing the protection necessary to keep these flocks stable or growing. Refuges will always be an essential component of Iowa's Canada goose program.

The giant Canada goose has been successfully reintroduced to nearly all of its former breeding range in Iowa. This was the result of a biologically sound,

comprehensive wildlife management program, and the benefits are just now being realized. Carefully managed penned flocks were the core of the initial restoration efforts. Large Canada goose refuges provided young free-flying geese the protection they needed to reach reproductive age. A comprehensive program to address and solve goose depredation problems enabled these flocks to continue to grow on a limited habitat base. The transplant program expanded the nesting range of the giant Canada goose in Iowa to a point where geese are now nesting in nearly all counties in the state. All this effort has resulted in year-round viewing and increased harvest opportunities for all Iowans.

The future looks bright for the giant Canada goose in Iowa. There is still room for continued growth of this population, especially along the state's border rivers, on the numerous farm ponds scattered throughout the southern half of the state, on inland reservoirs and rivers, and on the new wetlands restored through the Prairie Pothole Joint Venture program. Plans are in place for new flocks

and refuges near Red Rock and Lake Odessa as well as some other possibilities around some of the new lake construction projects. The next decade will undoubtedly see continued growth and expansion of the Iowa flock, and the southern tip of the prairie pothole region will once again send tens-of-thousands of giant Canada geese into the autumn skies.



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